

Progress Report for  
PMET Minigrant  
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We began with no specific mathematics courses for elementary teachers at our university. Students took a survey of mathematics course and either College Algebra or Elements of Statistics, which really did not meet their needs. As a result of our attendance at the PMET workshop held in Boone, NC, we began the journey to change this. Over the course of the year from 2003-2004, we developed two courses for elementary teachers. Those courses met with many obstacles. These obstacles included justification for the appropriate content level as well as opposition to the name of the course. We felt it was important for students to gain a deeper understanding of fundamental mathematics topics, not simply using algorithms. This situation was resolved after many months of discussion and compromise. We eventually received the approval of the department, university-wide curriculum committee, deans, provost, and president. Prior to the approval of our courses, we were able to conduct two seminars with teachers at Franklin Elementary School using some of the activities we were planning for these courses. This validated the content and applications we wanted to stress in our courses. We began offering the courses (Mathematical Reasoning I and II) during the Spring 2005 semester.

We applied for a PMET mini-grant because we realized that in order to implement these courses in a viable fashion, manipulatives were vital and we had no resources at this time. We did not want these courses to be presented in a traditional lecture format. We wanted to use a constructivist approach as we felt not only would this provide a more learner-centered environment, but also believed it provided a very important modeling situation for these pre-service teachers. If we expect future teachers to use hands-on materials, we need to demonstrate their importance in our classrooms. The importance of presenting material using multiple models is stressed.

Our grant money provided many manipulatives for use in our classes. As a result of our endeavors with these new courses, we were contacted by the Titusville School District to provide a graduate level version for their elementary teachers of grades three through five. During the 2004-2005 academic year, we presented these in-service teachers with many constructivist ideas for use in their classes. We took many of our activities and materials to our in-service programs and teachers were then able to order similar manipulatives for their classroom use. It should be noted that various principals attended and participated in our in-service programs and thus were supportive of these initiatives. We were notified by the curriculum director, Debbie Amsler, from Titusville School District that their PSSA scores in mathematics improved 10 points, due in part to the activities and concepts presented during our course and utilized by their teachers in the classroom. We surveyed the teachers after each session to obtain information about what topics they wanted us to address at the next session. In addition the teachers were required to email us updates concerning how they adapted the activities for various grade levels and their particular students. We were able to observe these teachers' classes throughout the year. These observations and comments served as a valuable resource for

our classes. We can testify that the material we presented is actually being used in classrooms.

The impact of these courses continues through various presentations we have given. We have presented ideas for pre-service teachers at various mathematics conferences (AMTONP- Association for Mathematics Teachers of Northwest Pennsylvania, PCTM- Pennsylvania Council of Teachers of Mathematics, SSHE-MA –State System of Higher Education Mathematics Association, CETP-PA – Collaborative for Excellence in Teacher Preparation). We have also presented local in-service for high school and middle school mathematics teachers at the Penncrest School District.

In Spring of 2005, the first semester our courses were offered, it became apparent that regular desks were not conducive to these classes. We had students actively participating in the activities, but had them sitting on the floor in the room, in the hall, or attempting to put desks together. The materials were stored in a cupboard in a small room (closet). As a result of this, we approached our CETP-PA organization, an initiative to improve excellence in teacher preparation. They provided us with another cupboard and with additional manipulatives as a result of positive feedback from the Education department as to the value of our courses. Because of the good relations with the School of Education, we were able to order fourteen trapezoidal tables and to establish a room specifically for these courses. The School of Education paid for these tables. We forgot about chairs. However, we were able to locate desks through the University Facilities office that were not being used. They traded our desks for chairs. With a designated room, we were able to move the cupboards with our manipulatives to this room. This room provides an atmosphere conducive to learning.

The change in attitude towards mathematics is apparent. Students work and talk mathematics in class. These courses have been embraced by the students. These courses are very relevant for future teachers. Without the PMET grant these courses would not be possible in their present form. The impact goes beyond these courses. As stated above, the ideas are being shared through in-service and conference presentations. However, it should be noted that other professors are now incorporating our manipulatives into other courses (e.g. statistics, calculus, etc). Our department has embraced constructivist teaching and these have aided immensely.